

Code:

```
import java.util.Map;

import java.util.HashMap;

class Tester {

    public static void main(String args[]) {

        Map<String, Integer> books = new HashMap<String, Integer>();

        //Adding key-value pairs to the map
        books.put("Data Structures With Java", 50);
        books.put("Operating System", 80);
        books.put("Let Us C", 70);
        books.put("Java Fundamentals", 40);

        //Displaying all the key-value pairs present in the map
        System.out.println(books);

        //Traversing the map
        //entrySet() method is used to retrieve all the key value pairs
        for(Map.Entry<String, Integer> book:books.entrySet())
            System.out.println(book.getKey()+" "+book.getValue());

        //keySet() method returns the keys in the Map
        for(String name:books.keySet())
            System.out.println("key: "+name);

        //values() method returns the values in the Map
        for(int quantity:books.values())
            System.out.println("value: "+quantity);
```

```
//Removing element based on key
```

```
books.remove("Let Us C");
```

```
//Removing element based on value
```

```
//Uncomment the code given below, execute and observe the output
```

```
//books.remove(70);
```

```
//Removing element based on key and value
```

```
//Uncomment the code given below, execute and observe the output
```

```
//books.remove("Let Us C", 70);
```

```
System.out.println(books);
```

```
//Replacing key-value pair in the map
```

```
books.replace("Operating System", 80, 100);
```

```
System.out.println(books);
```

```
//Getting a value from the map based on key
```

```
System.out.println(books.get("Java Fundamentals"));
```

```
//Printing size of the map
```

```
System.out.println(books.size());
```

```
//Removing all the key-value pairs from the map
```

```
books.clear();
```

```
//Checking if the map is empty
```

```
System.out.println(books.isEmpty());
```

```
}
```

```
}
```

Output:

{Operating System=80, Let Us C=70, Java Fundamentals=40, Data Structures With Java=50}

Operating System, 80

Let Us C, 70

Java Fundamentals, 40

Data Structures With Java, 50

key: Operating System

key: Let Us C

key: Java Fundamentals

key: Data Structures With Java

value: 80

value: 70

value: 40

value: 50

{Operating System=80, Java Fundamentals=40, Data Structures With Java=50}

{Operating System=100, Java Fundamentals=40, Data Structures With Java=50}

40

3

true